CABLE TIES HAVING INNATE CONNECTION COMPATIBILITY WITH MOUNTING PLATES

FIELD OF THE INVENTION

This invention relates generally to cable ties and pertains more particularly to cable ties configured for use with mounting plates closely mounted on parent support structure.

BACKGROUND OF THE INVENTION

In various instances, it is desirable to bind cable ties upon a mounting plate which is so closely mounted on parent structure as to deny user access to the undersurface of the mounting plate. In these instances, it is necessary to remove the mounting plate from its parent structure. This practice presents evident difficulties in possible disruption of pre-existing cable bundlings supported on the mounting plate and in electrician time in effecting the disassembly of the mounting plate from the parent structure and reassambly following the binding of the cable ties to the mounting plate.

In those instances in which the mounting plates are not removable from their parent structures, i.e., are riveted or otherwise permanently secured to the mounting plate, the difficulty is not resolvable and additions of cable tie encircled conductor groupings to the pre-existing closely-mounted mounting plate are not attainable.

SUMMARY OF THE INVENTION

The present invention has as its primary object the provision of cable ties adapted for securement with mounting plates closely mounted to parent structure without need for removal of the mounting plates from the parent structure.

In attaining this and other objects, the invention provides cable ties having configuration providing them with an adaptiveness for securement with mounting plates closely mounted to parent structure.

In its several embodiments, the invention provides cable ties having configuration which self-urges free ends of the cable ties to emerge from mounting plates after the free ends of the cable ties are inserted into disposition into the limited space existing between the mounting plates and parent structure to which the mounting plates are secured.

The invention is adapted for use with removable mounting plates, without need for removal thereof from parent structure to which the mounting plates are secured, and for use with non-removable mounting plates.

The foregoing and other objects of the invention and the various structures of cable ties thereof will be further understood from the following detailed description of preferred embodiments and practices of the invention and from the drawings wherein like components are identified by like reference numerals.

DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a first embodiment of a cable tie in accordance with the invention.

Fig. 2 is a perspective view of a second embodiment of a cable tie in accordance with the invention.

Fig. 3 is an elevation, partly in section, showing a first stage of assembly of the cable tie of Fig. 2 with a mounting plate.

Fig. 4 is an elevation, partly in section, showing a second stage of assembly of the cable tie of Fig. 2 with a mounting plate.

Fig. 5 is an elevation, partly in section, showing a final stage of assembly of the cable tie of Fig. 2 with a mounting plate.

Fig. 6 is a perspective view of a third embodiment of a cable tie in accordance with the invention.

Fig. 7 is an elevation, partly in section, showing the assembly of the cable tie of Fig. 6 with a mounting plate.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to Fig. 1, cable tie 10 includes a head portion 12 and a tail portion 14 contiguous with head portion 12 and extending to tail portion free end 16. Serrations (not shown) are formed on either or both of top and bottom sides 18 and 20 of tail portion 14. Head portion 12 includes pawl 22 extending into through passage 24. As is known, pawl 22 may be a plastic member integrally formed with cable tie 10 or may be a metal member.

Cable tie 10 is a molded plastic member, the making mold being constructed to impart undulation 26 to tail portion 14 at tail portion free end 16.

Referring to Fig. 3, mounting plate 28 defines apertures 30 and 32 extending therethrough. Undulation 26 of tail portion 14 is inserted into aperture 32, which is of a cross-dimension 34 less than the cross-dimension 36 of undulation 26. Undulation 26 is accordingly cross-wise compressed in the course of the insertion, as shown in a first stage of assembly of Fig. 3.

Referring to Fig. 4, which shows a second stage of assembly, undulation 26 is shown inserted fully into and through aperture 32, whereby undulation 26 expands to its molded cross-dimension 36. Cross-dimension 36 is selected relative to apertures 30 and 32 such that tail portion free end 16 is disposed below aperture 30 upon such expansion of undulation 26 to its molded cross-dimension 36.

Tail portion 14 is now moved upwardly from its Fig. 4 disposition to its Fig. 5 disposition, whereby tail portion free end 16 emerges upwardly of aperture 30, permitting a user to grasp such free end and pull tail portion 14 upwardly of mounting plate 28. Tail portion 14 is now moved into encircling relation with conductors (not shown) disposed atop mounting plate 28 and tail portion free end 16 is inserted into head portion 12. Tail portion 14 is now pulled through head portion 12 by a user or tool to

tightly encircle the conductors.

Referring to Fig. 2, cable tie 38 differs from cable tie 10 in that its undulation 40, formed at the free end 42 of strap 44, the undulation being disposed in orthogonal relation to strap 44, in contrast to the undulation of cable 10, which is aligned with the strap in a first course and in spaced, parallel relation to the strap in a second course.

Installation of cable tie 38 on a mounting plate follows the practice of Figs. 3-5, above discussed.

The innate connection compatibility of cable tie 46 of Figs. 6 and 7 is attained differently than that of cable ties 10 and 38. Here, strap 48 is of arcuate, preferably semicircular configuration throughout its length, the arcuateness being selected in correlation with the spacing between apertures 50 and 52 of mounting plate 54, such that, upon insertion of strap free end 56 into aperture 52, the free end emerges from aperture 50.

As is seen, the invention provides a method for securing a cable tie to a mounting plate having a given clearance with a parent structure precluding access to an underside of the mounting plate, comprising the steps of:

(a) configuring a strap of a cable tie with innate connection compatibility with the mounting plate;

(b) inserting a free end of the cable tie into a first aperture in the mounting plate; and

(c) pulling the free end of the cable tie outwardly of a second aperture in the mounting plate.

The innate connection compatibility is attained by configuring the strap with an inherent arcuateness at the strap free end. The inherent arcuateness can be selected as an undulation formed at the strap free end. The undulation may be formed with a course which extends in spaced perpendicular relation to the strap or with a course which extends in spaced parallel relation to the strap.

Various changes to the particularly depicted embodiments and practices of the invention may be introduced without departing from the scope of the invention. Accordingly, it is to be appreciated that the particularly disclosed embodiments are intended in an illustrative, and not in a limiting, sense. The true spirit and scope of the invention is set forth in the ensuing claims.